MARINE REVIEW.

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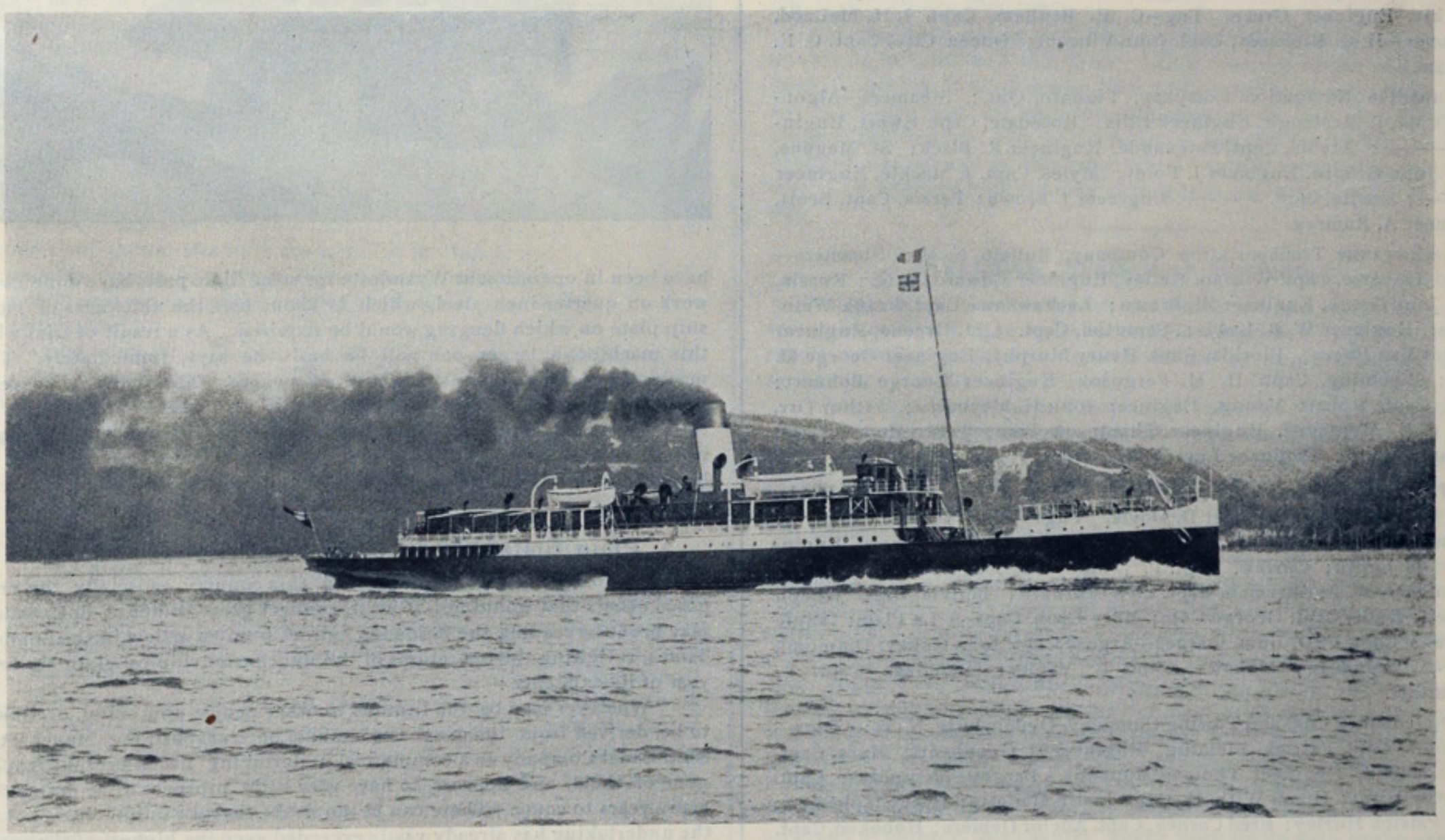
Fuel Economy with Cylindrical Boilers.

In the REVIEW of Oct. 4 and 25, 1894, the steamers Seaford and La Tamise are described. These vessels are owned by the London, Brighton & South Coast Railway and are engaged in the channel service between Newhaven and Dieppe. They are fast twin-screw ships, and they have attracted a great deal of attention, on account of one of them, the La Tamise, being fitted with Belleville tubulous boilers, while the other, the Seaford, has cylindrical boilers. Inquiry has been made as to the exact difference in the consumption of fuel on these two steamers, and it is found to be ten tons in favor of the Seaford, which is fitted with the cylindrical boilers. As the consumption is 27½ tons in one case against 37½ in the other, the difference is full 36 per cent. in steamers of the same size, running on the same route and making the same time, viz., 3 hours 15 minutes between ports.

The water tube boiler question is growing warm in Great Britain, and this statement of fuel cosumed by these boats is publicly made in a communication to the London Times by John D. Ellis of Messrs. John Brown & Co., who are manufacturers of Serve's ribbed tubes, Ellis & Eaves draft and other specialties, and who are represented in this country by Charles W. Whitney of 64-68 Broadway, New York. Mr. Ellis' authority for the statement is understood to be Professor Biles, who designed the steamers Paris and New York and also the Seaford. The Seaford, built by Messrs. Denny of Dumbarton, Scotland, has cylindrical boilers, ordinary Serve tubes, plain stay tubes, and closed stokehold forced draft. The sister ship, La Tamise, was built in France and fitted with Belleville boilers. They both develop the same indicated horse power and have the same speed.



TWIN-SCREW PASSENGER STEAMER SEAFORD.

Canadian Canal and Lake Superior Draft.

With the announcement from the Canadian government that no tolls will be charged to vessels passing through the new canal at Sault Ste. Marie, Ont., vessel owners have begun to figure on the possibility of securing even an inch or two extra draft next season, by having their vessels use the Canadian canal when bound down from Lake Superior. Of course, there is no certainty of the Canadian waterway being open for the passage of vessels generally upon the opening of navigation. Reports said to come from the engineers in charge have caused the impression to go out that the canal will be in readiness for the passage of vessels of all kinds shortly after the opening of Lake Superior navigation, but vessel men at the Sault are of the opinion that it will be well into the summer before all work necessary to regular locking of vessels is completed. It may be expected, however, that during the greater portion of the coming season, the Canadian canal, opening full 17 feet draft, will be as free to vessels trading to Lake Superior as the present American canal and lock, which will permit of not more than 14 to 15 feet, the outside figure being an extreme limit under the most favorable conditions of water. It is understood that Gen. Poe does not expect at the best to do more than pass a few vessels late in the fall through the new American lock, which is not to be fully opened until next spring.

But for two or three years past some vessel owners have been of the opinion that a regard, probably a little over-zealous, for the miter sill of the present canal has caused the United States engineers to demand an allowance of safety in the matter of vessels' draft that may be taken advantage of in the deep Canadian canal. In this connection, however, the question of draft at several points in the Sault river, which are eventually to be dredged to 20 feet, must be taken into consideration. There is no definite information as to whether these places, known to be shallow, will permit of even a few inches more draft than was allowed in the American canal last season. It is probable that the question will be settled only by actual trial. Conservative vessel owners will order their captains to continue their passages through the American canal, unless the early completion of the dominion waterway offers occasionly a saving of time on account of lockage, but it is probable that some vessel will be found to test the question of finding a little more water in the Sault river, by passing through the Canadian canal with a larger load than would be permitted on the American side. If an advantage is gained, no matter how small, then more frequent lockages may be expected in the new dominion waterway.

Appointments of Masters and Engineers.

Loutit, W. H., Grand Haven, Mich.: Steamer—Pentland, Capt. Thomas McCambridge.

Rice, John, Buffalo, N. Y.: Steamer—Robert Mills, Capt. Robert Drury, Engineer T. F. Batrick.

Port Huron & Detroit Rapid Transit Company, St. Clair, Mich.: Steamer—Unique, Capt. John Robertson, Engineer T. W. Robertson.

Monroe & Nichols, Charlevoix, Mich.: Steamer—Pine Lake, Capt. Eph. Small, Engineer John Chemock. Schooner—Annie P. Grover, Capt. Fred Lorenz.

Beatty Line, Sarnia, Ont.: Steamers—Monarch, Capt. Edward Robertson, Engineer Edward McKeen; United Empire, Capt. John McNoble, Engineer C. Scott.

Clough, H. H., Elyria, O.: Steamers—Parks Foster, Capt. Geo. E. Merritt, Engineer Peter Marcoux; Ira H. Owen, Capt. J. Q. Owen, Engineer A. W. Wilcox.

Shaw, John, Bay City, Mich.: Steamers—C. A. Eddy, Capt. E. Smades, Engineer S. S. Cowell; E. C. Pope, Capt. J. H. Smith, Engineer H. Annett; Selwyn Eddy, Capt. H. L. Shaw, Engineer R. Hill.

Republic Steamship Company, M. M. Drake, manager, Buffalo, N. Y.: Steamers—Brazil, Capt. Joseph Hulligan, Engineer Albert Edger; America, Capt. James Gibson, Engineer John Haig; Maytham, Capt. A. B. Drake, Engineer Robert Close.

Benham, C. E., Cleveland, O.: Steamers—Britannic, Capt. W. P. Benham, Engineer J. F. Walsh; Quito, Capt. J. D. Mullen, Engineer J. C. Johnson; Nahant, Capt. E. Detlefs, Engineer Norman; H. B. Tuttle, Capt. Thos. Delarkie, Engineer Green. Tug—C. E. Benham, Capt. J. H. McLeod. Schooner—H. C. Richards, Capt. John Vincent; Queen City, Capt. C. E. Benham.

Canadian Navigation Company, Toronto, Ont.: Steamers—Algonquin, Capt. J. McMaugh, Engineer Ellis; Rosedale, Capt. Ewart, Engineer ———; Arabia, Capt. Patenaude, Engineer R. Black; St. Magnus, Capt. John Gifford, Engineer J. Foley; Myles, Capt. J. Mackie, Engineer ———; Acadia, Capt. ———, Engineer J. Brown; Persia, Capt. Scott, Engineer A. Ramsey.

Lackawanna Transportation Company, Buffalo, N. Y.: Steamers—Grand Traverse, Capt. William Kelley, Engineer Edward Carter; Russia, Capt. John Green, Engineer W. Brown; Lackawanna, Capt. Frank Weinheimer, Engineer W. B. Lewis; Scranton, Capt. J. H. Greene, Engineer Charles Van Every; Florida, Capt. Henry Murphy, Engineer George M. Wise; Wyoming, Capt. H. H. Ferguson, Engineer George Bohnert; Cuba, Capt. Robert Young, Engineer John H. Mayberry; Arthur Orr, Capt. C. Z. Montague, Engineer Thompson Pike; J. W. Moore, Capt. Richard Neville, Engineer Levi Walder.

Hall, George, Coal Company, Ogdensburg, N. Y.: Steamer—Hecla, Capt. D. Hourigan, Engineer D. Doyle. Tugs—W. L. Proctor, Capt. W. A. Russel, Engineer A. E. Cline; Thos. Wilson, Capt. J. Richard, Engineer R. J. Jardin; Curlew, Capt. P. J. McGrath, Engineer G. M. Cline. Schooners—W. A. Sherman, Capt. C. W. Howard; Bolivia, Capt. Joseph Gooden; Beals, Capt. George Cote; Mary Lyon, Capt. S. La Flam; Jennie Mathews, Capt. F. D. Lum. Barges—Argosy, Capt. John Gokey; Diamond, Capt. A. Rabideau; Mohawk, Capt. L. Venier; Onondaga, Capt. U. Brunett, Jr.

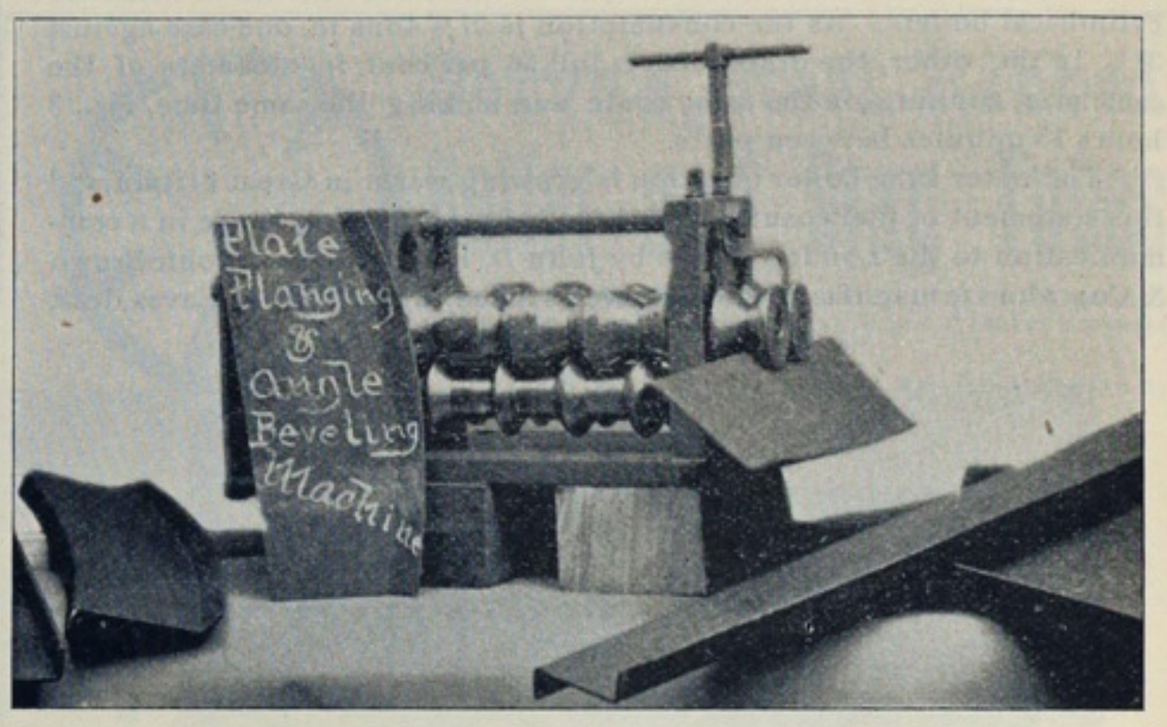
Ogdensburg Coal and Towing Company, Ogdensburg, N. Y.: Tugs—Seymour, Capt. Patrick Fleming, Engineer H. Goodheart; Myra, Capt. James Martin, Engineer Thomas Simmons. Barges—Menominee, Capt. Timothy Hunt; Henry Witbeck, Capt Justin Mallette; Isaac Stephenson, Capt. Patrick Hurley; Fred Carney, Capt. Adelor Demers; Hoboken, Capt. Ed. Maloney; H. B., Capt. M. Rodrigue; James Buckley, Capt. Jos. Lalonde; England, Fred Depontigny; Ireland, Capt. Damase Latour; Scotland, Capt. Theo. Lepine; Aid, D. Sauve. No appointments have as yet been made for the barges Argo, Kent and Mary.

Anchor Line, Buffalo, N. Y.: Steamers—India, Capt. P. O'Neil, Engineer D. Donahue; China, Capt. C. Christy, Engineer John Wise; Japan, Capt. H. Cronkhite, Engineer W. Wilson; Gordon Campbell, Capt. Chas. Nelson, Engineer W. Millington; Alaska, Capt. Geo. Delaney, Engineer G. W. Town; Wissahickon, Capt. John McCarthy, Engineer F. Rehbaum; Delaware, Capt. A. McKenzie, Engineer A. Birdsell; Juinata, Capt. D. Ryder, Engineer J. Forrester; Conestoga, Capt. H. O. Miller, Engineer W. Daltin; Lycoming, Capt. L. Wright, Engineer J. H. Smith; Conemaugh, Capt. F. Bloom, Engineer W. A. Black; Lehigh, Capt. J. H. Berow, Engineer T. Griffin; Clarion, Capt. J. Corcoran, Engineer J. Erskine; Codorus, Capt. M. Rowan, Engineer W. J. Swain; Mahoning, Capt. H. Durker, Engineer C. J. Fox; Schuylkill, Capt. John Doherty, Engineer J. E. Jordan; Susquehanna, Capt. M. Riley, Engineer Wm. Nolan.

Western Transit Company, Buffalo, N. Y.: Steamers—Arabia, Capt. Robert Murray, Engineer Patrick Welch; Badger State, Capt. ———, Engineer ———; Boston, Capt. Dugald Buie, Engineer Thomas McCabe; Buffalo, Capt. Patrick Shea, Engineer William McNulty; Chicago, Capt. F. J. McCabe, Engineer F. A. Miller; Commodore, Capt. R. D. Gardner, Engineer J. W. Brooks; Empire State, Capt. ———, Engineer ———; Harlem, Capt. Frank Williams, Engineer M J. Laney; Hudson, Capt. A. J. McDonald, Engineer Moses Trouton; Idaho, Capt. ———, Engineer ———; McCormick, Capt. M. A. Huntley, Engineer James Richards; Milwaukee, Capt. Michael Folan, Engineer J. W. Rainey; Mohawk, Capt. Valentine Jones, Engineer Henry Hess; Montana, Capt, S. R. Jones, Engineer William Tibby; Syracuse, Capt. Donald Gillies, Engineer J. W. Mark; Vanderbilt, Capt. Neil McCormick, Engineer F. W. Hale.

Flanging Rolls.

F. A. Kirby, superintendent of the Detroit Dry Dock Company's ship building plant at Wyandotte, Mich., sends the REVIEW the accompanying illustration of a plate flanging and beveling machine, which he patented recently. Mr. Kirby says that experimental rolls of this kind, which



have been in operation at Wyandotte for some time past, have done good work on quarter-inch steel, which is about half the thickness of most ship plate on which flanging would be required. As a result of trial with this machine, a larger one will be built, he says, immediately. The machine will flange plate straight or on a curve. The radius of curve is limited, but sufficient for 90 per cent. of ship yard work. The grooves in rolls between the housing are intended for opening and closing angle iron to any desired angle, and this for a ship's frame is important, as it leaves no curve in the flange to which outside plating is riveted.

Plain Statement of Manchester Canal Failure.

Promoters of inland ship-canals in this country, especially the proposed canals that would not, if built, connect great bodies of deep water, may profit by reading the following extract from an article in the London Times, reviewing the operations of the Manchester ship-canal for the first year of its existence:

"Whatever may be the benefits to other people now being, or likely to be, derived from the canal as a channel of transport, the Manchester Ship Canal Company as a commercial undertaking has at present reaped none of them, and appears to have very little prospect of so doing for many years to come. There can be no doubt that the outlay involved in the undertaking has already vastly exceeded even the highest of the early estimates; that further capital expenditure is urgently necessary if the canal is to be put in a position at all to realize the expectations of its original promoters; that, apart from this, maintenance charges, at any rate for some years to come, will be very heavy, and that so far is the present revenue from being adequate to meet such charges or even to pay working expenses, that on the first year's operations it is not much more than sufficient to pay interest on the first 4 per cent. debentures, not to mention the £5,000,000 corporation loan, least of all the £8,000,000 of ordinary and preference stock which is held by the unfortunate stockholders in the undertaking. The fact is—to put the matter as nearly in a nutshell as is possible—that the promoters of the enterprise originally thought that they had only got to make a ship canal; they have found, or more accurately, those who have entered into their labors have found, that in order to make the canal of any real service they have got to create a port also."

F. W. Wheeler & Co. of West Bay City, Mich., now have under contract five big steel steamers and a wooden steamer, and it is probable that another contract with Eddy Bros. & Shaw will be closed shortly. This firm's latest order is one from Geo. W. Roby, L. C. Waldo and others of Detroit for a steel steamer 400 feet over all, 48 feet beam and 28 feet hold.

New Schedule of Wages.—The Engineers.

Most of the leading vessel owners had agreed, before the meeting of executive officers of the Lake Carriers' Association in Cleveland on Tuesday last, that the schedule of wages for the coming season should be the same as that of a year ago. There was accordingly little discussion of the subject when Secretary Keep and a few other owners from Buffalo and Toledo joined the Cleveland committee and passed upon the schedule that is printed below.

It was expected that at this meeting the vessel owners would take up the request made some time ago by lake representatives of the Marine Engineers' Beneficlal Association for a conference on the subject of wages and other matters pertaining to the relations of engineers with the owners. This matter was not, however, discussed at the meeting. Inquiry regarding it resulted in a statement from one of the officers of the association to the effect that Mr. Goulder, counsel of the association, who had talked with the engineers, submitted their request to President Livingstone of Detroit. Mr. Livingstone in turn instructed Secretary Keep to interview leading line managers of Buffalo regarding the advisability of holding such a conference, and also caused similar inquiry to be made in other places. Reports to Mr. Livingstone were to the effect that the owners who were interviewed said they saw no need of a conference and were opposed to it. Thus the matter was dropped, and for the present, at least, will probably end with a letter from M. Livingstone to the engineers giving the result of this inquiry.

Last season the ore trimming charge at Two Harbors and Escanaba was 3 cents, against 2½ cents at all other ports. A committee was appointed to endeavor to secure a reduction in the charge at the two ports named, so as to make the rate uniform at all ports. Salaries of officers and shipping masters were all fixed at the figures of last year, and it was agreed that the few private lights that were maintained on the Canadian side of the rivers last season should be continued. The full schedule of wages follows:

	Per month.
First class—Metal steamers having water bottoms and triple expansion engines:	
Chief engineer	$100 00
Second engineer	70 00
Second class—Metal steamers not included in Class 1, and wooden vessels with triple expansion and with compound engines, except the smaller boats, which may be put in Class 3:	
Chief engineer	75 00 to 90 00
Second engineer	60 00
Third class—Smaller boats with high pressure or low pressure engines, or with compound engines, covering all boats not included in the two former classes:	
Chief engineer	60 00 to 75 00
Second engineer	50 00
OTHER EMPLOYES ON STEAMERS.	
First mates	50 00 to 70 00
Second mates	35 00 to 50 00
Cooks	35 00 to 50 00
Helpers to cooks	10 00 to 15 00
Firemen	25 00 to 30 00
Wheelsmen	25 00 to 30 00
Lookouts	20 00 to 30 00
Deckhands	12 00 to 15 00
Oilers	25 00 to 30 00
EMPLOYES ON SCHOONERS AND TOW BARGES.	
First mates	30 00 to 45 00
Second mates	25 00 to 35 00
Cooks	25 00 to 30 00
Seamen	25 00 to 30 00
Boys	12 00 to 15 00

Firemen engaged in fitting out vessels will be paid $1 a day, without board.

Shipping masters of the association for the coming season are as follows: Cleveland, A. R. Rumsey, with Charles Fisher as assistant; Chicago, Edward Nesbitt, with J. W. Hanson as assistant; South Chicago, M. P. Felt; Toledo, Patrick Mitchell; Buffalo, William Fletcher; Ashtabula, George Brooks.

TWO BOOKS OF SAILING DIRECTIONS, ONE COVERING LAKE SUPERIOR AND THE ST. MARY'S RIVER AND THE OTHER COVERING LAKE MICHIGAN AND THE STRAITS OF MACKINAC, ARE NOW OFFERED FOR SALE BY THE HYDROGRAPHIC OFFICE. THESE BOOKS ARE PARTS OF A WORK THAT WILL COVER THE ENTIRE CHAIN OF LAKES. THEY CONTAIN CHARTS OF LEADING CHANNELS AND HARBORS, AND MAY BE HAD FROM THE MARINE REVIEW, 516 PERRY PAYNE BUILDING, CLEVELAND, AT $1 EACH.

Ore Sales—Lake Freights.

Some ore dealers are of the opinion that if the 1895 output of iron ore from all Lake Superior districts is conservatively estimated at 8,000,000 gross tons, two-thirds of this amount is provided for, as regards transportation, by boats controlled in the offices of the ore companies and by outside tonnage chartered during the past few weeks. This is a broad statement, however, as there is no way of securing definite figures on the subject. Sales of Bessemer ores, other than Mesabis, thus far made aggregate about 3,500,000 tons, and this is said to practically close out the output of such mines as the Chapin, Chandler, Ashland and two or three other properties producing the most desirable ores of the old ranges. The high grade Mesabis have not been selling very actively, for the reason that furnacemen who have bought largely of the best old-range ores will use low-grade Mesabis for mixtures, as they can not get the low-grade ores of the past from the old ranges, and it is thought that this condition will act against ready sale of the high-grade Mesabis.

Very little has been done in vessel contracts during the past few days. Neither ore dealers nor vessel owners seem disposed to urge much further business on the 80-cent Lake Superior basis. One contract covering 50,000 tons of Escanaba ore, to be shipped by one of the oldest of the ore companies, was closed at 50 cents for the full season. A large number of vessels now at Lake Michigan ports are offered for the first trip from Escanaba, and might be had at 45 cents if shippers were in readiness to close such engagements. This condition is due, of course, to the poor prospects in Chicago grain trade. The big steamers Harvey H. Brown, Merida and Yuma will all be engaged on contracts this season between the head of Lake Superior and South Chicago, and will make few, if any, trips to Ohio ports.

For numerous reasons, it is expected that shipments of soft coal will be very light until well into June. Labor troubles in the coal mining districts and the limited demand for early supplies at upper lake ports are conditions that are very unsatisfactory in the soft coal business. There is nothing doing in contracts, and if any coal for the head of Lake Superior was offered at this time vessels would probably be found to take it on engagements running throughout the season at 30 cents or less.

Technical Schools in Germany.

United States consular reports for March contain some interesting information regarding technical schools in Germany. A portion of the reports relating to schools devoted to marine engineering and naval architecture is as follows:

"Anyone familiar with the Germany of the years before 1866 and 1870 will find food for reflection when he looks back on those times and compares them with today. Germany has been revolutionized. Berlin's growth is paralleled only by that of Chicago. In nothing is this change more noticeable than in the merchant and naval marine of the empire. The Clyde with Glasgow, Belfast bay with Belfast, and the best ship yards of England find very close competitors in German ship yards. Bremen, Hamburg, Kiel and Stettin are rapidly rising into as great importance as Glasgow, London, Liverpool and Belfast. In searching the underlying causes of this phenominal growth, not a few of the factors are found in recent adaptations of technical instruction to all branches of marine education. All over the empire, where shipping of any kind prevails, there are schools for teaching the technology of navigation, marine engineering and machinery. Besides royal or imperial schools for this purpose at Berlin, there are small ones at Kiel, Hamburg, Bremen and Flensburg. The rapidly increasing importance of the German merchant marine, the necessity of knowing the simplest, cheapest and best methods of construction of ships, if this country would keep up its well begun competition with Great Britain, were some of the immediate causes that called these schools into existance.

"In most of the schools there are four classes corresponding with the four classes enumerated under the imperial law of July 26, 1891, regulating the examinations and diplomas of machinists for sea or ocean steamers. The first and second class have annually two terms of twenty-two weeks each, and the fourth class two terms of eight weeks each. Besides these, the first and second classes have annually two preliminary courses of six weeks each. The expenses for first class are 50 marks ($11.90); second class, 40 marks ($9.52); third class, 30 marks ($7.14); fourth class, 20 marks ($4.76). In the fourth class the studies are German, mathematics and mechanics; in the third class German, penmanship, mathematics and mechanics; in the second class, German, English, mathematics, mechanics, physics, regulation of machines and drawing; and in the fourth class, German, English, planometry, stereometry, arithmetic, trigonometry, mechanics, physics, chemistry, work on machines and drawing. To obtain a fundamental, practical training, it is recommended to candidates to serve at least twelve months in a first-class machine shop, and, when possible, in a shipbuilder's machine shop, or with a locksmith and afterward with a ship building machinist.

Ship Building During the Last Quarter.

Following is a statement of sailing and steam vessels built in the United States and officially numbered, as shown by records of the bureau of navigation, treasury department, during the quarter ended March 31, 1895:

Section of Country.	Steel.		Iron.		Wood.			
	Steam.		Steam		Steam.		Sail	
	No.	Gross.	No.	Gross	No.	Gross.	No.	Gross.
Atlantic and Gulf coasts	1	179.17	5	2,810.09	10	3,128.97	48	2,693.16
Pacific coast	.....	.....	.....	.....	4	925.30	12	378.18
Great lakes	1	3,400 08	.....	.....	1	10.21	2	13.40
Western rivers	1	5 94	.....	.....	9	524.00	.....	.....
Total	3	3,585.19	5	2,810.09	24	4,588.48	62	3,084.74

The above table represents a total of ninety-four vessels of 14,068.50 gross tons, and of these vessels thirty-two measuring 10,983.76 tons were steam, and sixty-two measuring 3,084.74 tons were sail. During the previous quarter the number of vessels built in all parts of the country was 123, and the gross tonnage 22,441.07. The division as to steam and sail in the previous quarter was forty-six steam of 12,740.29 tons, and seventy-seven sail of 8,700.78 tons. Of course the number of vessels launched on the lakes during the three winter months ending on March 1 last was very light.

Corrosion of Hulls and Boilers.

Under similar conditions of working, steel corrodes much more rapidy than iron, and salt water is a much more active crrosive agent upon either iron or steel than is fresh water. These are facts to which attention is directed in an article contributed to Cassier's Magazine, by Wm. C. Ward, an engineer expert who is employed with the Boiler Insurance and Steam Power Company of Manchester, England. With steel unprotected and exposed to the action of the weather and sea water, corrosion advances at the rate of one inch in depth in eighty-two years, while under the same conditions for iron the rate is one inch in 190 years. When exposed to the weather and fresh water, it is 170 years for steel and 630 years for iron. When always immersed in sea water, the periods are one inch in 130 years for steel, and one inch in 310 years for iron; and when always immersed in fresh water, the periods become 600 years for steel and 700 years for iron. These conclusions are the result of years of patient experiment and observation by Mr. Parker of the British board of trade, and Mr. Phillips of the British institution of civil engineers. The chief points which should be attended to by those who have charge of steamships or steam boilers are summed up as follows:

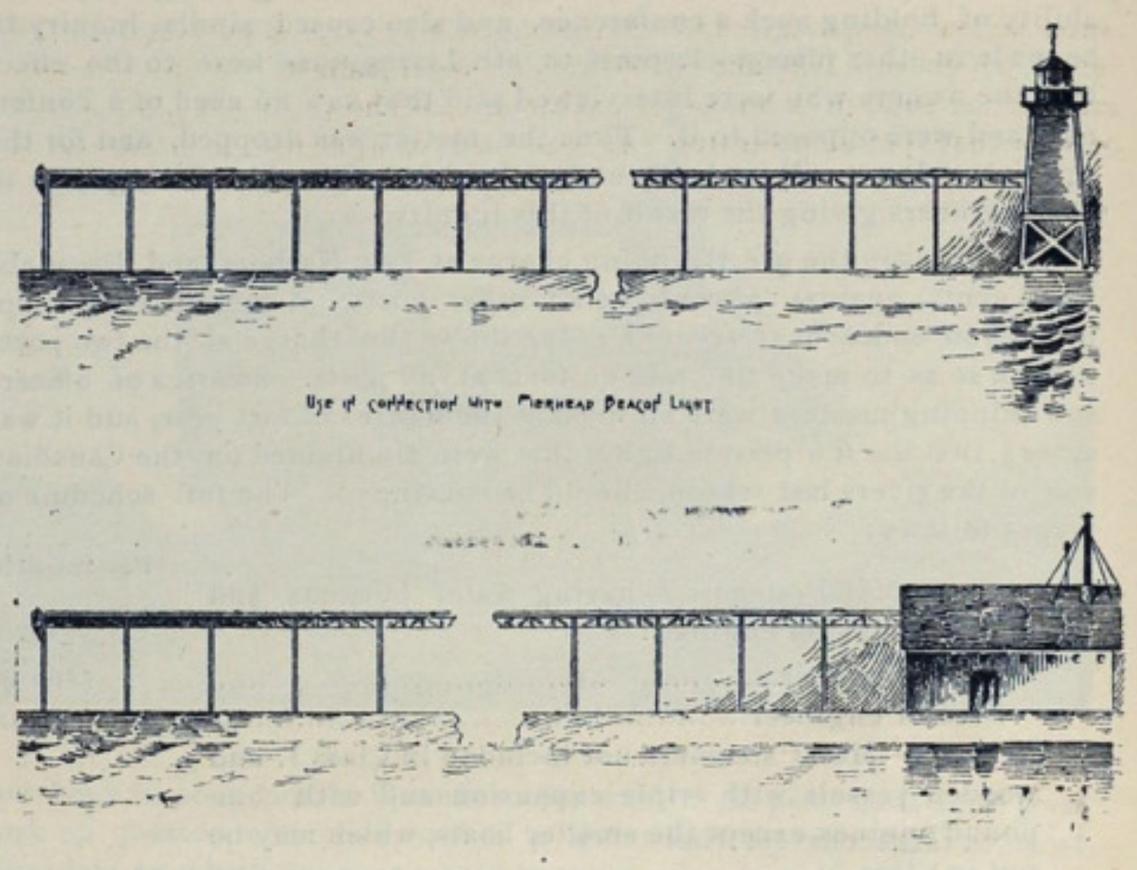
As to the hull.—If of iron, see that all blisters and rust are removed by chipping; and if of steel, the magnetic oxide or mill scale should have been removed before applying the paint. Use paint of a good quality; one that consists of a compound of zinc or lead will be best, because it will be more readily oxodized. See that the surfaces are thoroughly dry before painting, as it is quite usual to see paint put upon ships' hulls when wet.

As to the boiler externally.—First, keep all seams, joints and rivets tight and free from leakage. Second, prevent, as far as possible, all moisture getting into contact with the plates. Third, at least once a year apply a coat of good paint, red lead and linseed oil being the best for this purpose. Boiler internally.—Firstly, select a good cylinder oil where it is impossible to work without one, and only use such oils as have a vaporizing point at a higher temperature than the temperature of the steam at the pressure at which the boiler is to be worked. Do not take the statement given of the vaporizing points of these oils for granted, even though it may be a standard brand or make, but see that each particular lot as supplied is equal to the sample which influenced the purchase, as it may be taken for granted that the lowest quality that will be accepted without complaint will be about the highest quality supplied. Under any condition endeavor to keep your boiler water as pure as possible.

Plan of Handling Range Lights.

At a great many points on the lakes, post lanterns are placed in advance of the usual pierhead beacon, for the purpose of forming therewith a range for approaching a harbor. In order to keep such post lights in position, it has been necessary to build, in the past, expensive and cumbersome elevated walks, outward from the pierhead, and expense has attended the rebuilding of these structures when carried away by storms. Major M. B. Adams, corps of engineers, U. S. A., who is the engineer of the ninth and eleventh light-house districts, with headquarters at Detroit, has recently put in operation at several points on Lake Michigan an inexpensive and successful conduit, by means of which the lantern referred to is hauled out at night to the pierhead and is hauled in at sunrise.

Major Adams describes the device in an appendix to the latest annual report of the light-house board, from which the engraving accompanying this article is taken. The plan is to convey the lantern through a continuous inclosed conduit, made of 1-inch boards measuring 1 foot wide by 2 feet 2 inches high in the clear, so as to allow the ordinary lantern, resting on a small car, to pass through. The conduit is supported at the desired elevation of the light on trestles placed at intervals of 16 feet, securely fastened to the pier timbers at their lower ends. The outer end of the conduit terminates in a box provided with three panes of glass on the front and on either side, forming a lantern having a galvanized sheet iron roof and globe ventilator. The car with lantern is conveyed back and forth between the beacon tower or fog signal house, and its position at the outer extremity, by means of an endless cord passing through a cheave or small blocks at the outer end, one-half of the cord being supported by small rings (fair-leaders or friction rollers) attached to one side of the conduit near the roof, the other half being connected to the car and



Use in connection with Pierhead Beacon Light

allowed to rest on the bottom of the conduit. The arrangement forms a continuous closed channel-way for the lantern, car, and maneuvering cord, completely housing them from the weather, susceptible of operation at all seasons and at considerable distances. Conduits varying in length from 100 to 580 feet have been constructed at Manistee, Muskegon, Grand Haven, Kalamazoo, St. Joseph, Kenosha, Racine, Sheboygan and Kewaunee.

The cost of these structures was about $1.02 per linear foot, which included all the necessary work of getting the ballast stone of the cribs out to fasten the trestles, and replacing the stone; also painting the conduit itself (not including trestles, which are rough) two coats of paint. Only one conduit, that at Kewaunee, has had the test of a winter's season, the others having been placed since spring of this year. They have all worked successfully, and with comparative ease by hand power, excepting one at Muskegon, the longest, which is operated by a small winch. The conduit can be added to at any time there is an extension made to the harbor piers, until such time as a limit (probably from 600 to 700 feet) is reached, when it may not be practicable to extend it on account of the amount of power necessary to propel the car. When this limit is reached, and an extension be necessary, it might in many cases be well, Major Adams says, to move the beacon light also.

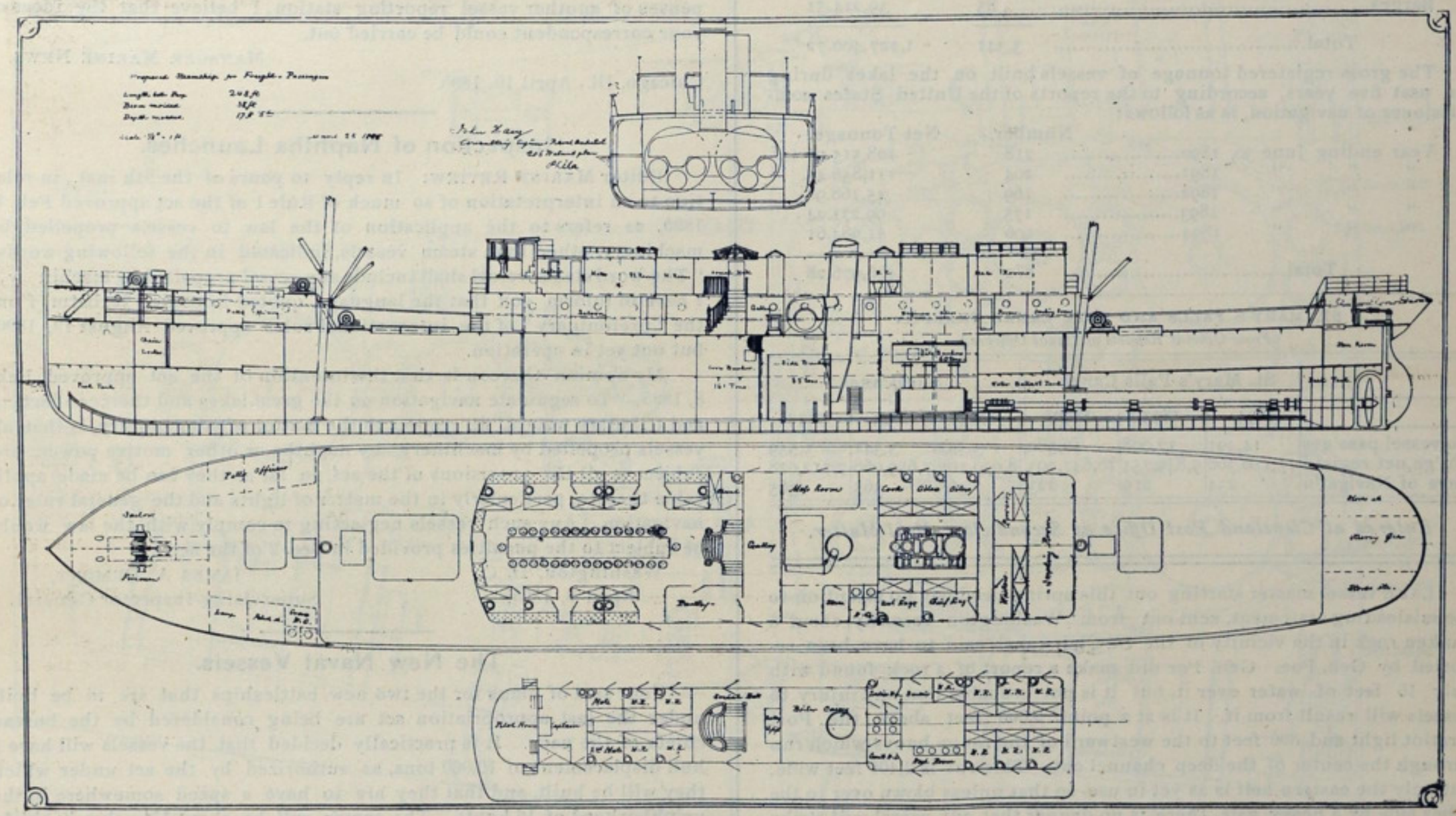
An attempt to do away with what is technically known among builders of steel and iron ships as packing is being tried by a well known English firm, William Doxford & Sons of Sunderland. A great deal of iron or steel is used in every ship for filling up spaces left in the ordinary course of work, such as, for instance, between the frames and the outside shell plates. The English firm has designed and patented a machine for so "joggling" the outside or covering plates as to admit of the whole inner surface—excepting, of course, that portion required to overlap the inside plates for riveting—being fitted close to the ships' frames, the plates by a comparatively simple arrangement, being indented to any length or width required. It is claimed for this system of plating that it saves the material usually required for packing, varying from thirty to one hundred tons, according to the size of the ship, and consequently saves the labor required to fix it; while the ship itself is divested of much useless dead weight, and has increased buoyancy, rigidity and carrying capacity. These are important advantages, and, if the ship builder saves in riveting and in material, the ship owner has the advantage of a lighter vessel, with increased cargo capacity.

Vessel for South American Trade.

A vessel for which the Cramps of Philadelphia recently closed a contract with Messrs. Boulton, Bliss & Dallett of New York is illustrated on this page. This firm manages the Red D line of steamships running between New York and South America, and this new boat is intended for trade to and from Maracaibo. To cross the bar at Maracaibo a draft of only 10 feet is permissable, on which the vessel will carry about 900 tons dead weight. She will be 248 feet on load water line, 38 feet moulded breadth and 17 feet 5 inches moulded depth. Her gross tonnage will be about 1,500 tons and her speed 11 knots, but she will make 12 knots on a four hours' trial, thus placing her in the fourth class of the United States ocean mail service and entitling her to the subsidy granted that class of vessels.

The hull is to be of steel, built to the highest class in the American Record. There will be a steel deck for half the length of the vessel amidships, a steel deck house containing limited passenger accommodations, a forecastle for the crew forward, and turtleback aft, all as shown on the plan. The vessel is divided by five watertight bulkheads. There is a water ballast compartment aft of the engines and one at each end of the vessel, which will take about 200 tons of water ballast. In the arrangement of the solid deck house for passengers, as shown on the plan, it will be seen that special attention has been paid to lighting and ventilating, to secure comfort in warm weather. The vessel is schooner rigged with pole masts and leg-of-mutton sails.

Engines are to be of the triple expansion type, with cylinders 18, 28 and 45 inches diameter, and a common stroke of 30 inches. All pumps will be independent. Boilers will be of steel, suited to 160 pounds working pressure. The donkey boiler will be extra large, to give plenty of steam for auxiliary purposes. Plans and specifications for this vessel were furnished by John Haug, naval architect and marine engineer, No. 206 Walnut place, Philadelphia.



STEAMER FOR NEW YORK–SOUTH AMERICAN TRADE.

From Richard P. Joy Abroad.

Editor MARINE REVIEW: You will doubtless be surprised to receive a letter from this part of the world, but as I have seen many strange merchant vessels, under almost every flag except the stars and stripes, I thought, perhaps, it might interest your readers to know that to the eye some of our modern lake steamers are far more pleasing than many of the 'steam tanks' I have seen here. However, these steamers have a rough and ready look, if not well kept up, and they all look alike, for they were all (almost without exception) built in England. England builds most of the shipping used throughout the world, because the British government fosters and encourages this most important industry in every possible way, and then, too, Britain has many natural advantages and her mechanics receive very low wages. The workmanship on the class of tramps that Britain sells to foreigners is not nearly up to the American standard; they are "slung" together, and an American ship builder would not let such work go out of his ship yard. England has for her ships the market of almost every country in the world, except the United States, and I am sure that Americans do well to keep their ship yards in existence by protection, until the people and the government awake to the necessity of encouraging the merchant marine by a systen of discriminating duties or otherwise. The national apathy in this direction is not a good sign. I hope the country will soon awake.

The French people build good and staunch vessels. This ship—La Touraine—is a fair example. The workmanship is of the first order. Her decks are particularly fine, being laid narrow seam and blind-fastened and the wood (oak) is remarkably free from knots and flaws—quite a contrast to the deck of a big passenger steamer of the lakes that I have in mind at this time.

At Ville Franca, near Nice, on the Mediterranean, I had the pleasure of inspecting the new French line-of-battle ship Magenta, she being one of a squadron of seven first class battle ships stationed at that point (more battleships in this one squadron than in the entire United States navy.) The Magenta is a splendid type of modern French design, she having the peculiar tumble home with guns mounted in barbettes, which stamps her at once a Frenchman. But to my mind guns mounted in turrets are more preferable, and the good freeboard of the new American battleships is certainly an advantage. At Alexandria the San Francisco graced the harbor with the stars and stripes. She looks very light and airy in her white dress and very unsubstantial alongside the heavy battle ships of England in their dress of gloomy black.

Since I left New York, I have not seen a vessel more pleasing to the eye than the Chemung, or any one of the Lehigh Valley liners, but these vessels are too bluff-bowed for ocean work, and they have not the flare to the bows necessary to keep their heads up in a head sea. This vessel—La Touraine—has not required the assistance of a tug since leaving New York, and it is quite a trick to handle a ship over 500 feet long in some of the narrow harbors we have visited. The twin-screws make it possible to handle her like a yacht.

Ocean-going ships are carrying less and less sail. This vessel does not even carry a "rag" to steady her in a sea. Tramp steamers are also doing away with sail, bare pole spars taking the place of heavy spars and yards. Steam has more responsibility thrust upon it every day, and engineers and firemen are in demand far more than seamen. The motive power in vessels is being transferred from towering spars to the dungeon depths of a steamer's hold.

On Board Campagnia Generale Transatlantique Steamer La Touraine, March 18, 1895.

RICHARD P. JOY.

Before purchasing your tickets, first ascertain the rate via the Nickel Plate road. 224 Ap130

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			SuezCanal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,105	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

LAKE vessel master starting out this spring need pay no attention to the misleading statement, sent out from Washington recently, about a sunken rock in the vicinity of the St. Clair canal, said to have been reported by Gen. Poe. Gen. Poe did make a report of a rock found with only 16 feet of water over it, but it is not probable that any injury to vessels will result from it. It is at a point 9,000 feet above the Fort Gratiot light and 300 feet to the westward of the range buoys which run through the center of the deep channel cut. This cut is 2,400 feet wide, but only the eastern half is as yet in use, so that unless blown over to the other side by a heavy gale, there is no danger that any vessel will strike it. It will probably be removed before boats are generally in commission.

PRACTICALLY all of the managers of vessel property on the lakes, excepting the line-boat managers of Buffalo, have signed the agreement to buy no fuel from Buffalo shippers of hard coal. The line boats have arrangements for fueling at the docks of railway companies that own them, and there is, of course, no necessity of their entering the agreement. No such agreement as this has ever before been so generally signed, and an opportunity is again offered to test the earnestness of vessel owners in matters of this kind.

IN a letter printed elsewhere in this issue, Gen. James A. Dumont, chief of the steamboat inspection service, expresses the opinion that under the new law for lake navigation—act of Feb. 8, 1895—naphtha launches, which would come under the head of vessels propelled by machinery, will be under the supervision of the steamboat inspection service, and must comply with the requirements of steamboat laws. This opinion, if sustained by the department will be the cause of more controversy.

CLEVELAND'S leading commercial body, the chamber of commerce, has considerable to do with the marine interests of the city, and vessel owners in all parts of the lakes will be pleased to learn that Mr. Wilson M. Day, who has always taken an active part in everything pertaining to the advancement of lake commerce, has just been elected to the presidency of that organization.

Reports of Vessel Passages From Detour.

Editor MARINE REVIEW: Replying to the following, which you have kindly sent me for comment:

"I noticed last fall that for the last few days of the season vessels were reported from Detour. It seems to me that the vessel reporting bureau would do a good thing by reporting from Detour the entire season, on account of the great delays met with at the 'Soo.' If a vessel is reported at Detour and also at the 'Soo,' as it is at present, we, of course, know how much time it takes between these two points; we can then very easily figure out the time which our boats had been obliged to lose at the lock. I think such a change would be appreciated by a good many of the vessel men. What do you think about it? I bring the matter to your notice because you are in close touch with Mr. Carr, and would ask, if it meets your approval, that you kindly bring the matter to his notice."

Vessels were reported from Detour last fall as a trial trip, as it were. Your correspondent may be right in stating that a permanent service at Detour will be of much value to vessel men, but until such time as there is a good telegraph service at Detour, it is hardly feasible to maintain a vessel reporting station at that point. Telephone lines have such a weakness for going down when most wanted that at critical times vessel reporters would find themselves unable to get their reports out. With a telegraph line at Detour, and the aid of vessel men in sharing the expenses of another vessel reporting station, I believe that the ideas of your correspondent could be carried out.

MANAGER MARINE NEWS.

Chicago, Ill., April 10, 1895.

Inspection of Naphtha Launches.

Editor MARINE REVIEW: In reply to yours of the 6th inst., in relation to an interpretation of so much of Rule 1 of the act approved Feb. 8, 1895, as refers to the application of the law to vessels propelled by machinery, other than steam vessels, indicated in the following words: "The word steam-vessel shall include any vessel propelled by machin y," I have to inform you that the language quoted is copied verbatm f om the "preliminary" of the international rules approved August 19, 1890, but not yet in operation.

My opinion thereon is that the intention of the act approved Feb. 8, 1895, "To reguulate navigation on the great lakes and their connecting and tributary waters," in respect to the matter of your inquiry, is that all vessels propelled by machinery, by naphtha or other motive power, are subject to all the provisions of the act, so far as they can be made applicable thereto, particularly in the matter of lights and the general rules of navigation. Any such vessels neglecting to comply with the law would be subject to the penalties provided in Sec. 2 of the act.

Washington, D. C., April 8, 1895.

JAMES A. DUMONT, Supervising Inspector General.

The New Naval Vessels.

Four sets of plans for the two new battleships that are to be built under the last appropriation act are being considered by the bureau chiefs of the navy. It is practically decided that the vessels will have a hull displacement of 10,000 tons, as authorized by the act under which they will be built, and that they are to have a speed somewhere in the neighborhood of 16 knots. The armor will be about 15 inches in thickness, and, unlike the armor on the present battleships, will be scattered all over the vessels. It is expected that the plans will be completed within the next six months.

Plans for the six new composite gunboats are radically different from those which at first were discussed. The vessels will be totally unlike those of a similar class now in service or under construction. At one time it was thought that they would be given high engine power and a corresponding rate of speed. The authorities have about decided, however, that it would be best to give them a moderate speed, and for this reason the plans contemplate only eleven knots per hour. The bottoms of the vessels are to be planked with yellow pine and coppered. Above the water line, the hull will be of steel. With a bottom of the nature stated, there will be no need of docking the ships every six months, as is necessary in the case of the navy's steel ships, but if occasion requires, they can stay in the water for at least two years without injury. These boats will be of a displacement of 975 tons. They will have an extreme breadth of 34 feet 6 inches, and an extreme length of 168 feet. The engines are to develop an energy of between 800 and 900 horse power. The coal bunkers of each vessel are calculated to hold 200 tons of coal. The mean draught is placed at 12 feet 6 inches. The ships will be barkentine in rig, and the spread of sail will be somewhere in the neighborhood of 12,000 square feet.

A yacht 160 feet long, which is being built at the Bath Iron Works, Bath, Me., for A. H. White of Boston, will be fitted with two Almy water tube boilers.

Around the Lakes.

Cleveland vessel owners have recommended that the veteran Capt. Geo. Warner be appointed harbormaster. He is certainly deserving of it.

One of the Canadian papers reports that the Canadian Pacific Railway is having a fast side-wheel steamer built on the Clyde for the route between Owen Sound and the Sault.

April 20 is the date set for the opening of the Welland canal. Towing charges at entering ports will probably be lower, as the tug owners have thus far failed to agree on rates.

Announcement of the formation of the Nicholas Transit Company is due simply to arranements for facilitating matters connected with the management of the Minch boats of Cleveland.

Babcock & Wilcox tubulous boilers, built for the new river steamer Unique, are being put into the boat, and it is expected that she will, when ready for service between Detroit and Port Huron shortly, prove as fast as was expected.

The light-vessel stationed at the foot of Lake Huron will next season be moved about 1,000 feet to the northward and eastward of the moorings occupied last season, in order to conform to the changes in the channel caused by dredging.

R. J. Cram & Co. of Detroit have purchased the tug Crosby from the Kirby-Carpenter Company of Menominee, Mich., for $4,500, and the Buffalo tug Cascade, one of the largest boats of her kind on the lakes, has been sold to Lorain parties.

Chief Shipping Master Rumsey of the Lake Carriers' Association returned to Cleveland from his trip around the world on the very day that arrangements were being made by the association for another season's business. He had been little more than four months in making the circle of the globe.

Hon. J. R. Whiting of St. Clair, Mich., is now president, treasurer and general manager of the Escanaba & Lake Michigan Transportation Company, owning the steamers Escanaba, Rhoda Emily and Argonaut. No officers have been engaged for these boats, as it is proposed to sell them if possible before the opening of navigation.

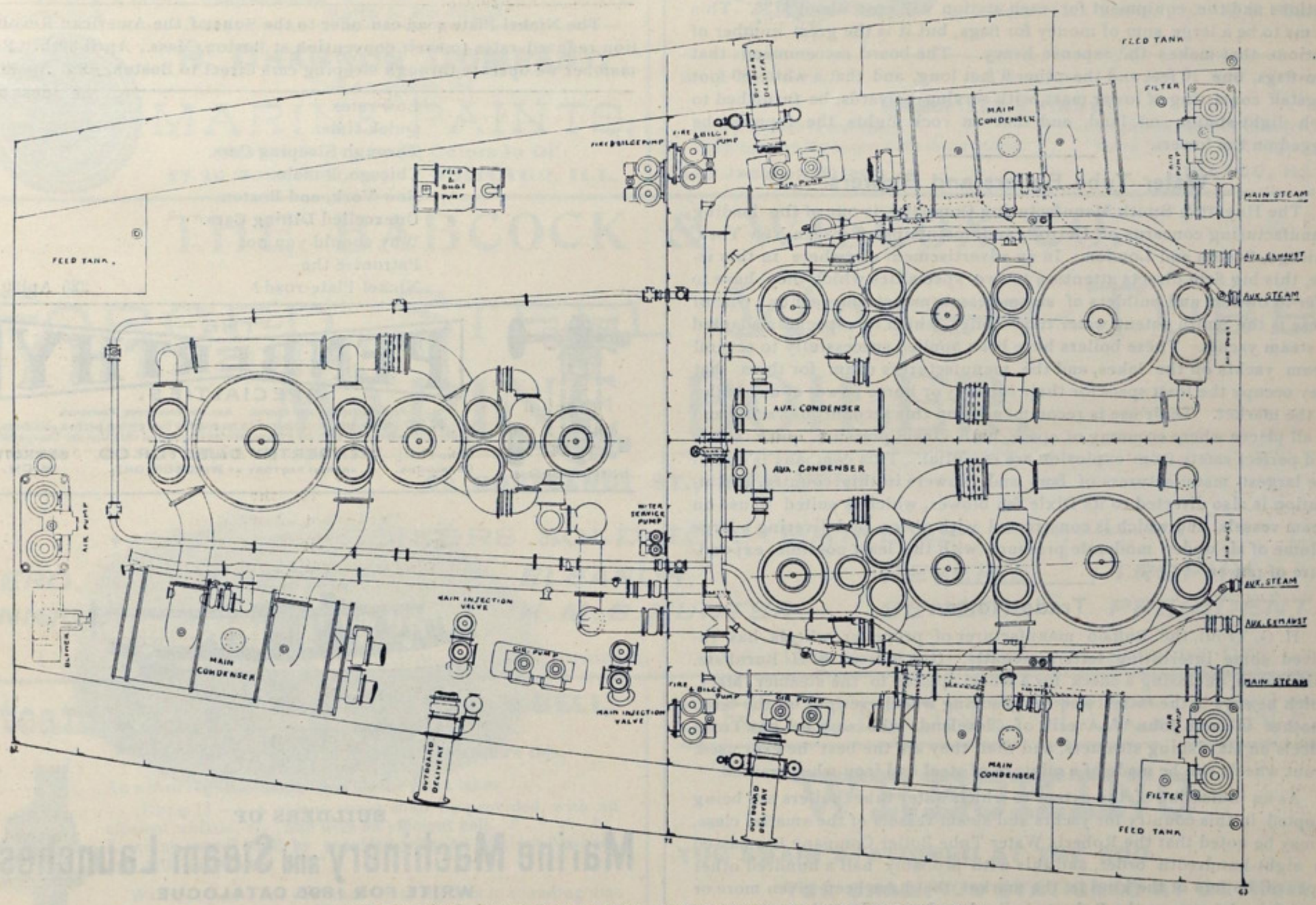
As an indication of the business carried on by boats that cross Lake Michigan during the winter, it may be noted that shipments from Milwaukee alone foot up, for the four winter months ending March 31, 606,035 barrels of flour, 1,759,541 bushels of oats, 353,997 bushels of barley, 45,659 bushels of rye and 8,266 bushels of wheat.

The return to the United States of Col. William Ludlow to assume his duties as a member of the Nicaraguan canal commission, appointed recently by the president, has caused the gossips at the war department to wonder if he will return to London as the military attache of the United States. The general impression is that he will not return, but will be assigned to duty in this country, and that some other officer will be given the desirable billet which Col. Ludlow now fills.—Army and Navy Journal.

In General.

The April number of the Nautical Magazine, London, contains an interesting article on triple-screw propellers. Discussion of the subject is not entirely technical. The article is based on success of the United States navy with the triple-screw cruisers Columbia and Minneapolis.

Messrs. Cramp of Philadelphia succeded in successfully launching, on Wednesday, the St. Paul, second of the big American line ships. There were no hitches in the second effort to float the boat. The accident with the St. Paul was the first that the Cramps had encountered since 1873.



ENGINE ROOM OF UNITED STATES TRIPLE-SCREW CRUISER MINNEAPOLIS.

Wisconsin legislators will probably repeal the vessel tax law recently passed in that state, and which was based on a tonnage system. It is proposed, however, to substitute another law, also based on tonnage figures. Tonnage measurements were never intended for application to municipal or state taxes, and it would seem that any system based on tonnage will be found to contain numerous objectionable features.

A contract has been awarded to the Carnegie Steel Company for furnishing material for Ward tubulous boilers for the U. S. S. Chicago, which has been ordered out of commission, but before deciding finally upon a type of coil boilers for this vessel, it is the intention of Engineer-in-Chief George W. Melville to experiment with several types of boilers which have been brought to his attention. He has been informed that the Babcock & Wilcox Company of New York has about completed a set of coil boilers, and that they will be ready for trial about April 15. This trial, together with the test of Babcock & Wilcox and Scotch boilers that is to be made at South Chicago in two big lake freighters, will have considerable to do with the conclusions of the department.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store and afloat at the principal points of accumulation on the lakes on April 6, 1895:

	Wheat, bushels.		Corn, bushels.	
	In store.	Afloat.	In store.	Afloat.
Chicago	23,614,000	2,738,000	5,024,000	2,420,000
Duluth	12,120,000	85,000	.....	.....
Milwaukee	682,000	.....	.....	.....
Detroit	1,138,000	466,000	163,000	.....
Toledo	1,869,000	343,000	755,000	.....
Buffalo	2,272,000	269,000	166,000	452,000
Total	41,695,000	3,901,000	6,108,000	2,872,000

Flags for Light-Stations.

The United States light-house board is endeavoring to secure funds from congress to display the United States flag from light-houses throughout the country. If the undertaking is carried out according to the plans of the board the cost will aggregate $121,000, as there are 930 stations and the equipment for each station will cost about $130. This seems to be a large sum of money for flags, but it is the great number of stations that makes the expense heavy. The board reccommends that two flags, one 10 feet and the other 6 feet long, and that a white 80-foot flagstaff consisting of lower mast, with serving halyards, be furnished to each light-station on land, and that on rock lights the topmast be rigged on the towers.

Water Tube Boilers and Blowers.

The Huyett & Smith Manufacturing Company is one of the leading manufacturing concerns of Detroit, and maintains offices in New York, Chicago, Boston and London. In an advertisement elsewhere in this issue, this big firm directs attention to two specialties which they have to offer to owners and builders of steam vessels and steam yachts. One of these is the Smith patent water tube boiler, which is especially adapted to steam yachts. These boilers have been applied successfully to several steam yachts on the lakes, and the manufacturers claim for them that they occupy the least space for their capacity or horse power of any boiler in the market. Their use is recommended on this account for yachts and in all places where economy of space, high steam pressure, quick steam and perfect safety from explosion are essential. This company is one of the largest manufacturers of fans and blowers in this country, and attention is also directed to its Dixie fan blower, which is suited to use on steam vessels, and which is constructed with a view to delivering a large volume of air under moderate pressure with the least possible expenditure of power.

Trade Notes.

H. G. Trout, the Buffalo manufacturer of propeller wheels, has received some interesting letters recently. One is from S. H. Burnham, Port Huron, enclosing a check for a wheel applied to the steamer Mary, which he says is the fastest and best backing wheel ever put on the boat. Another is from John W. Averill of Cleveland, who says he has Trout wheels on six fishing steamers, and that they are the best he ever used. Trout wheels can be made of a mixture of steel and iron when wanted.

As an indication of the extent to which water tube boilers are being adopted in this country for yachts and steam vessels of the smaller class, it may be noted that the Roberts Water Tube Boiler Company has passed its eight-hundredth order, and this with probably half a hundred other types of boilers of the kind in the market that have been given more or less trial. Of course the Roberts boiler has been adopted most extensively for small vessels, but the sale of it is a fair indication of progress that has been made in a few years with these generators.

"Around the Lakes,"

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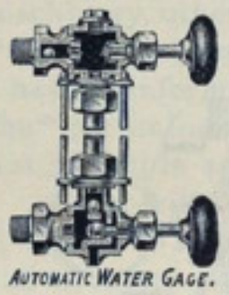
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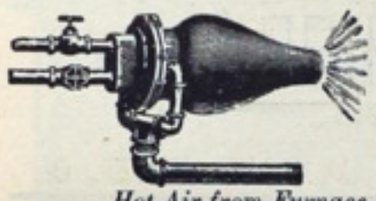

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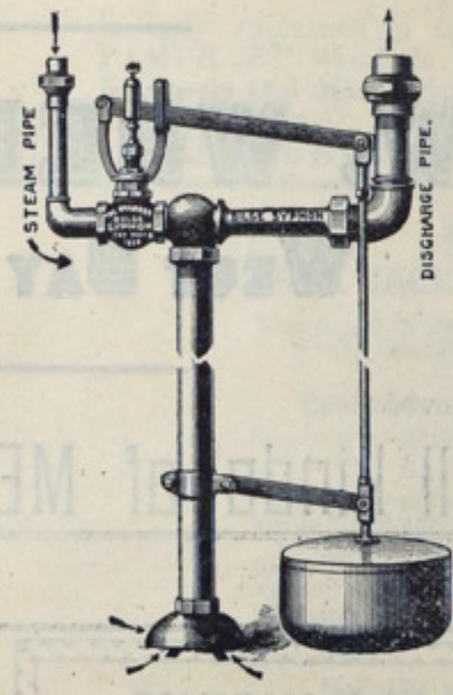

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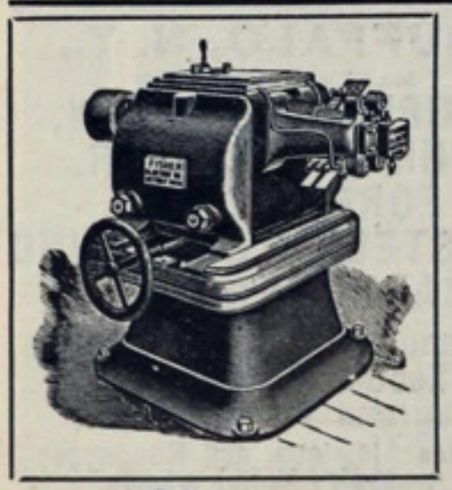

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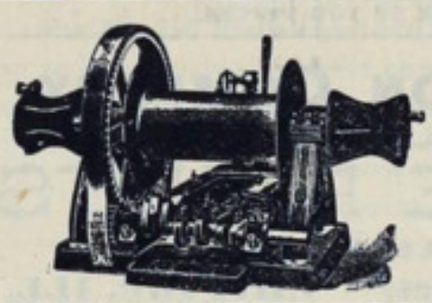

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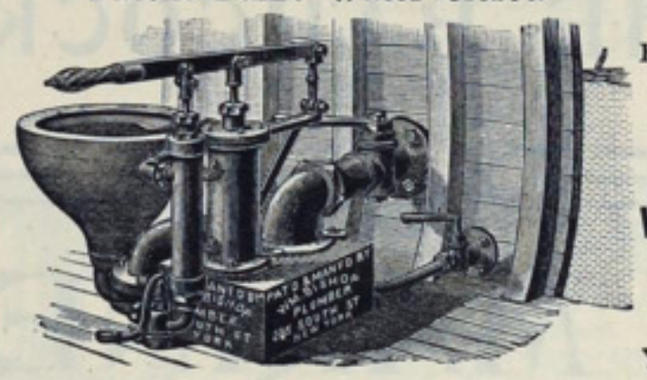

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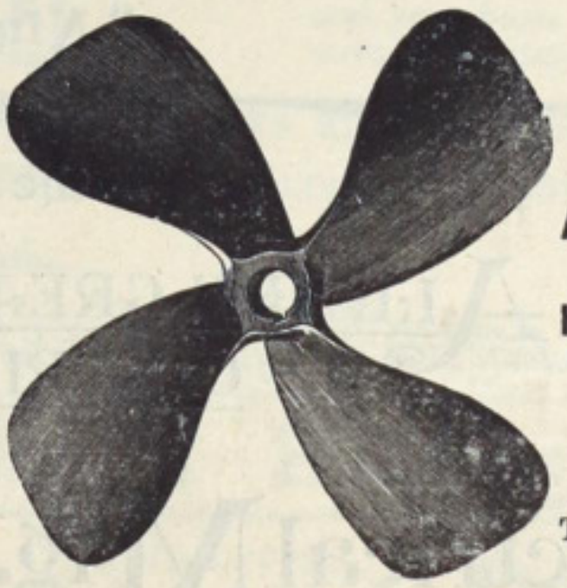

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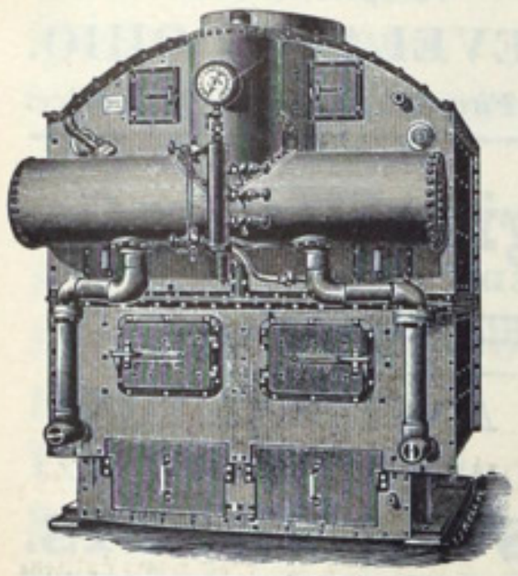

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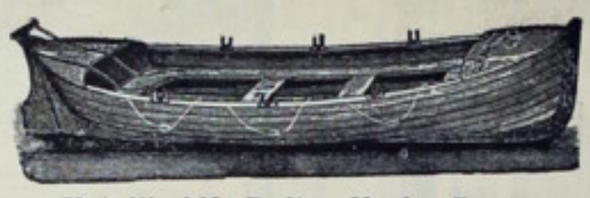

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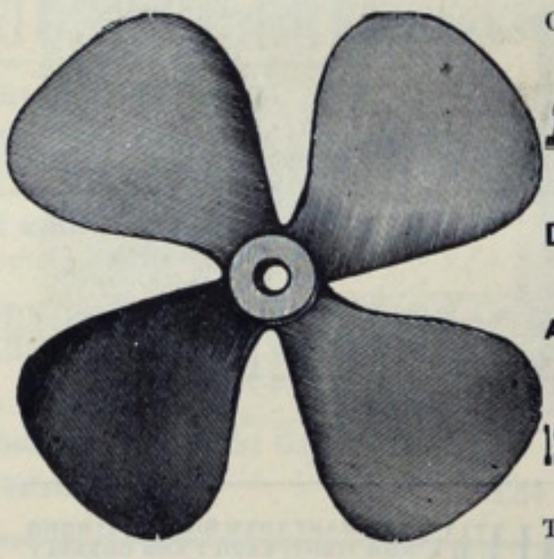

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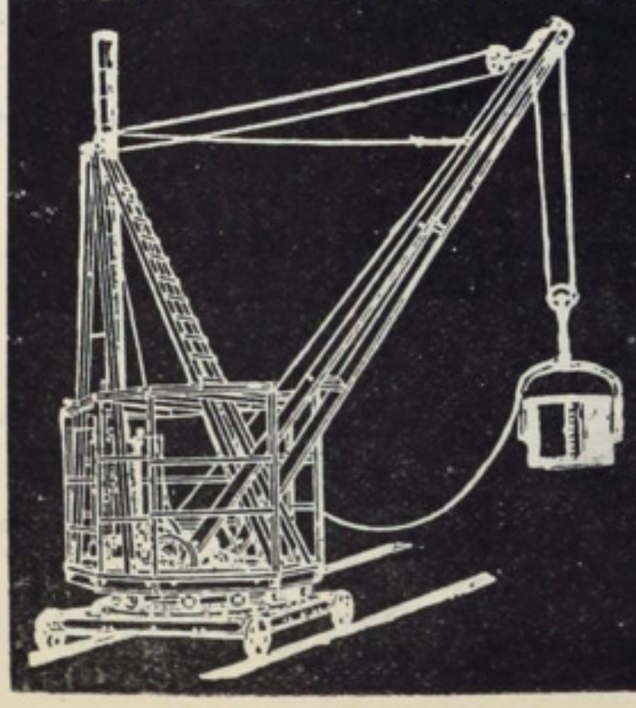

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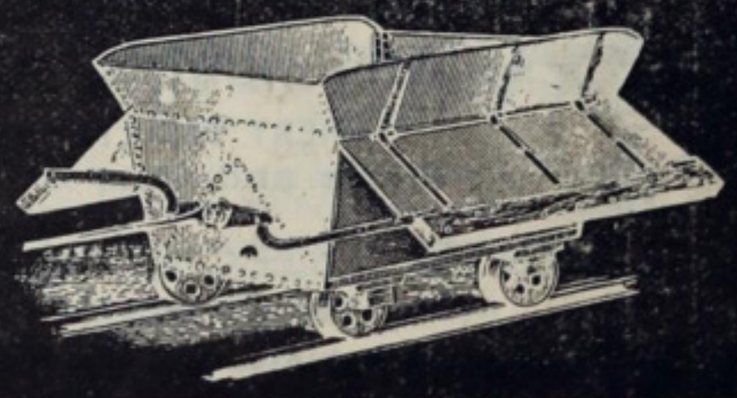

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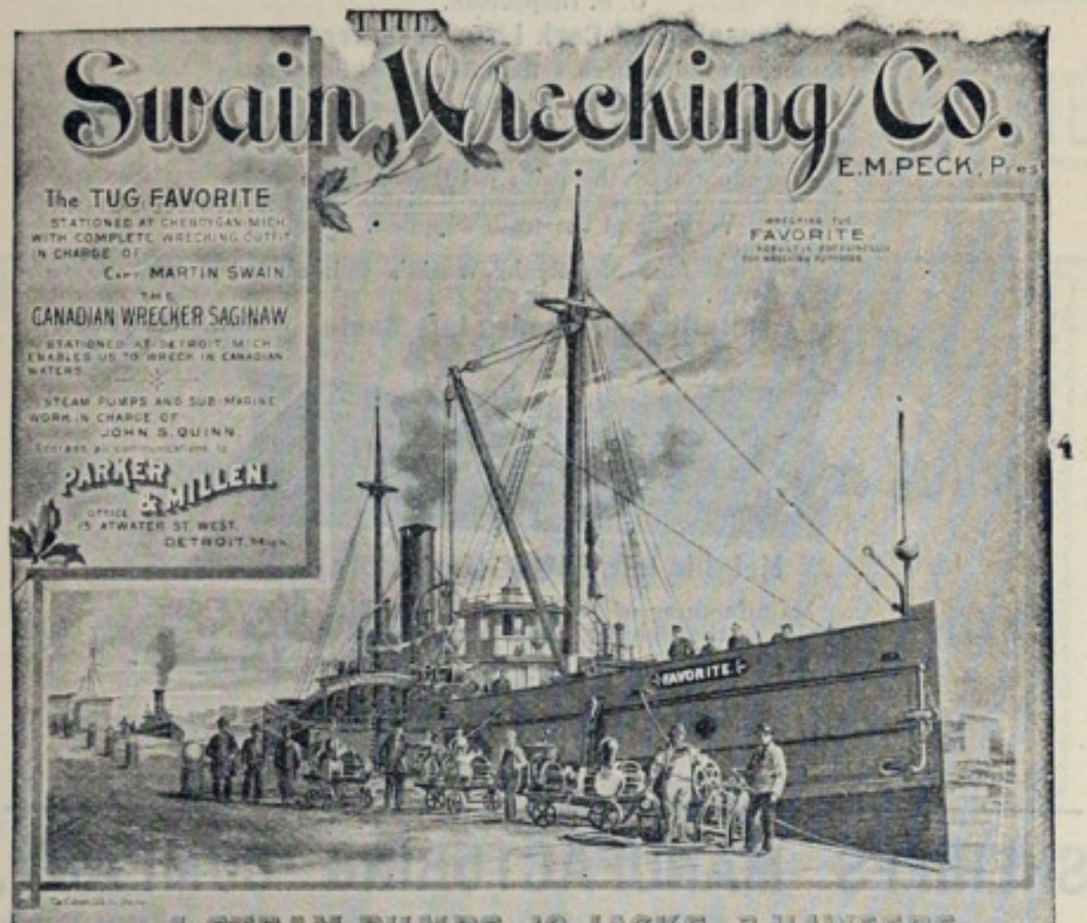

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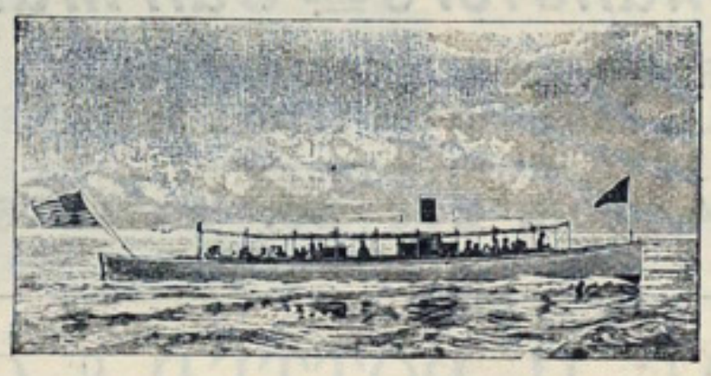

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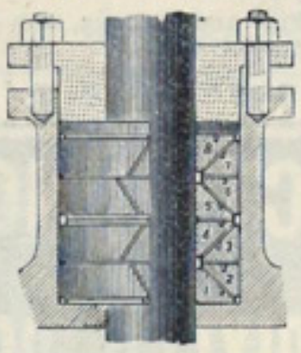

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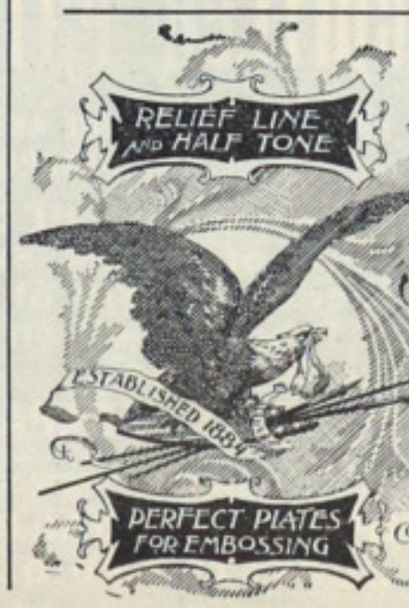

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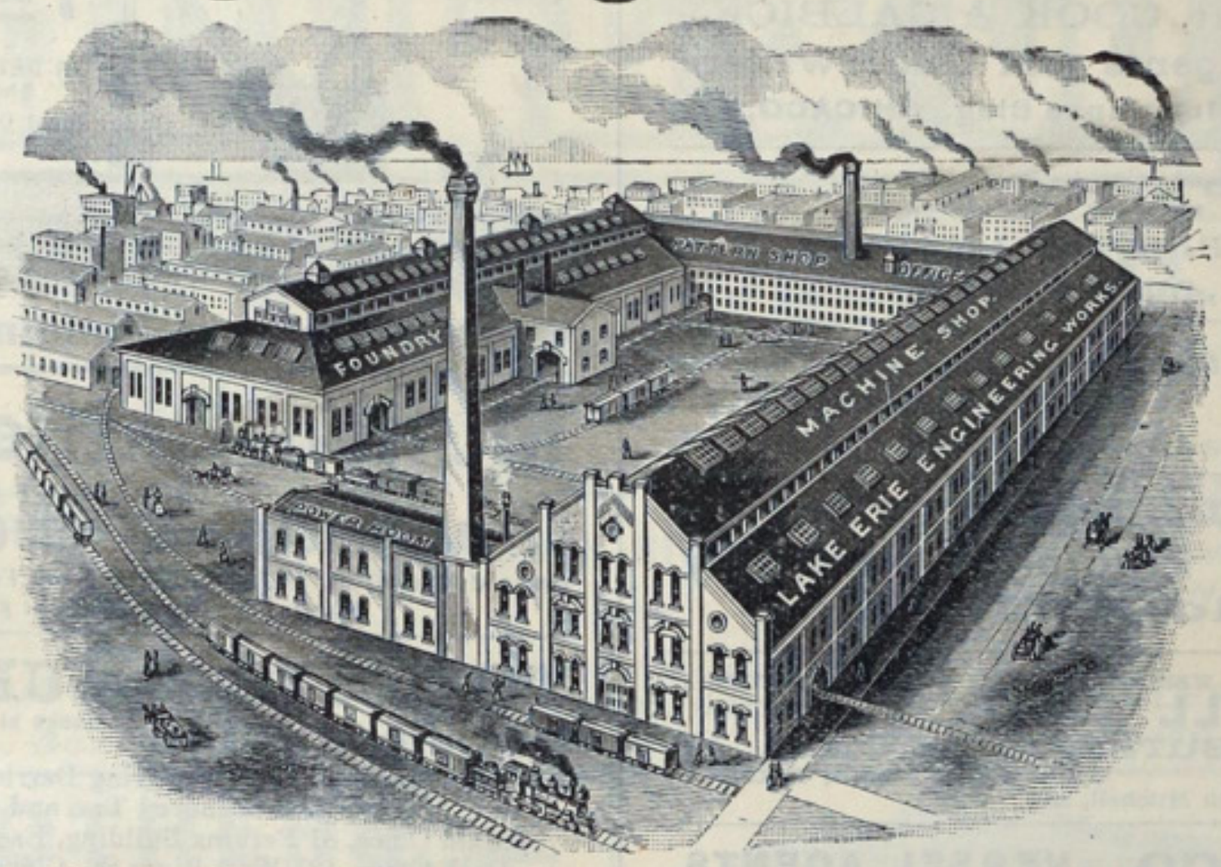

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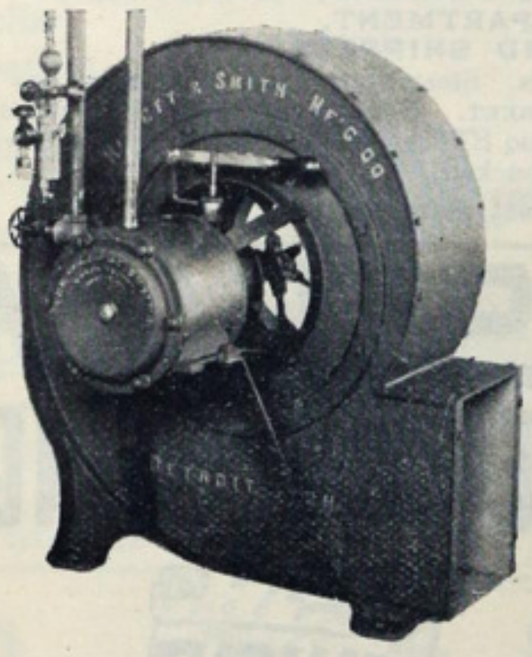

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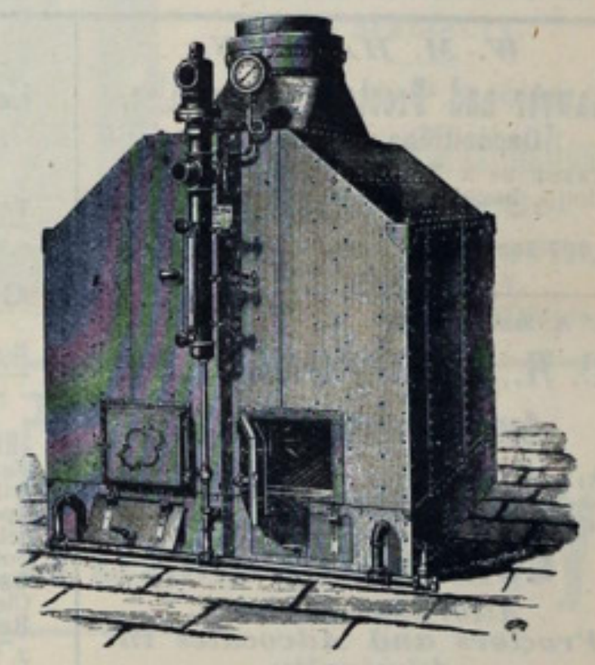

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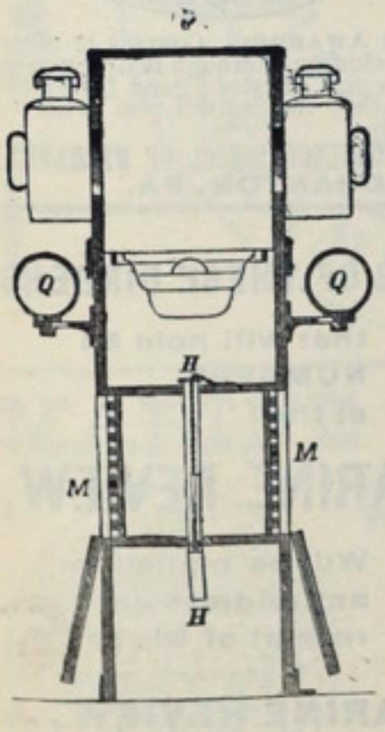

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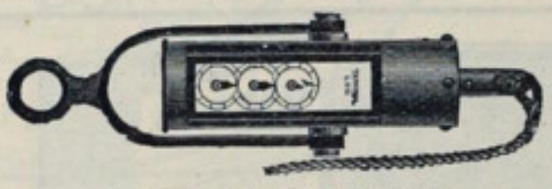

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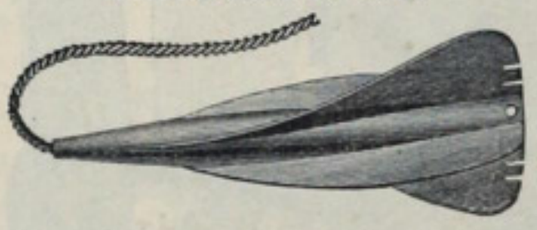

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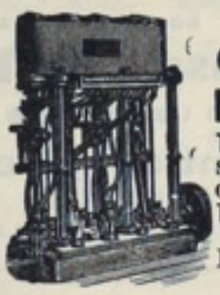

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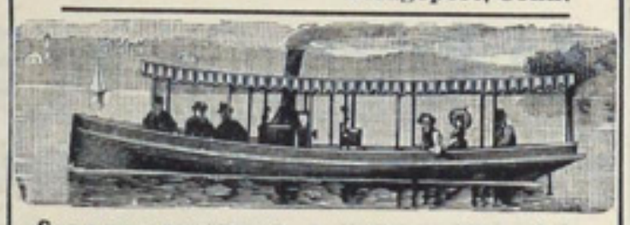

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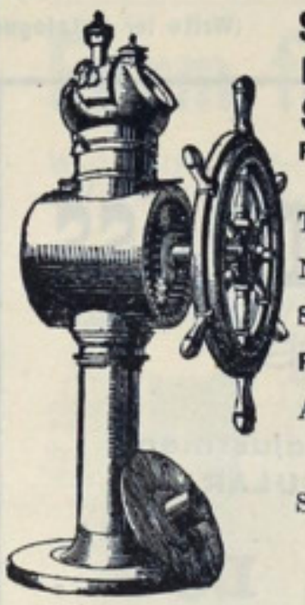

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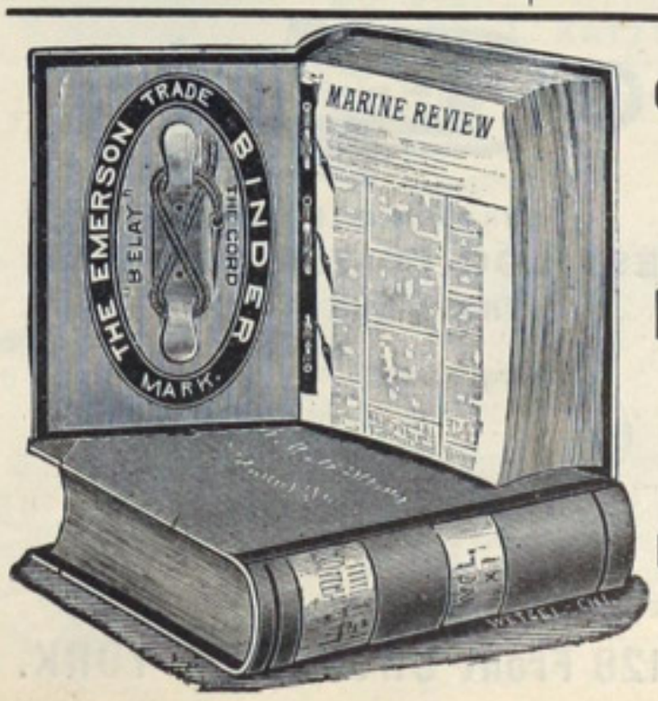

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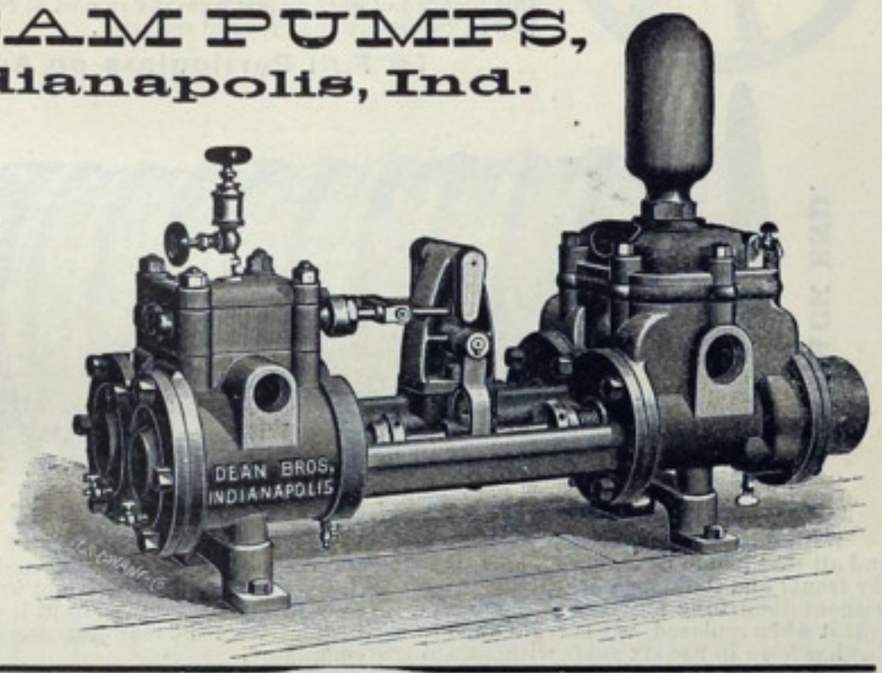

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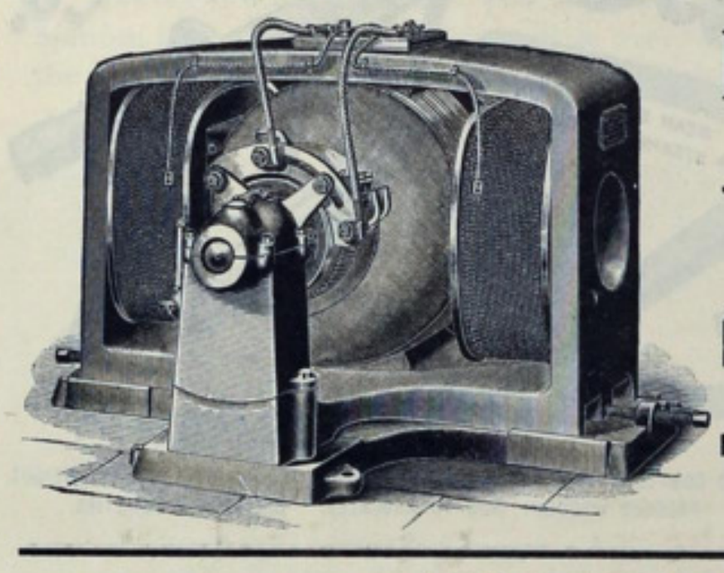

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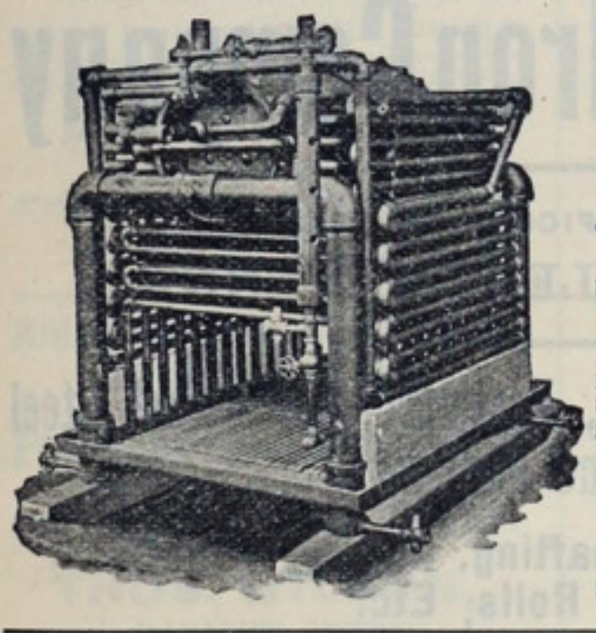

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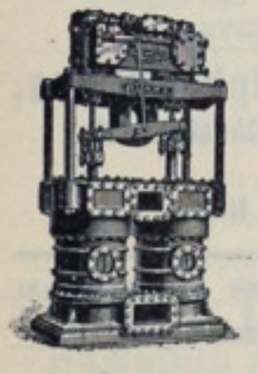

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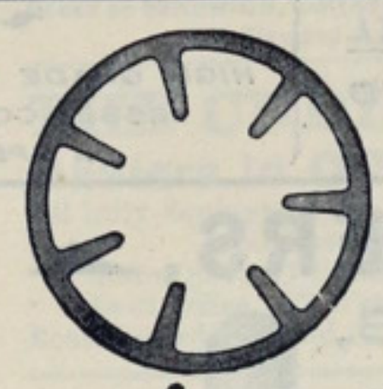

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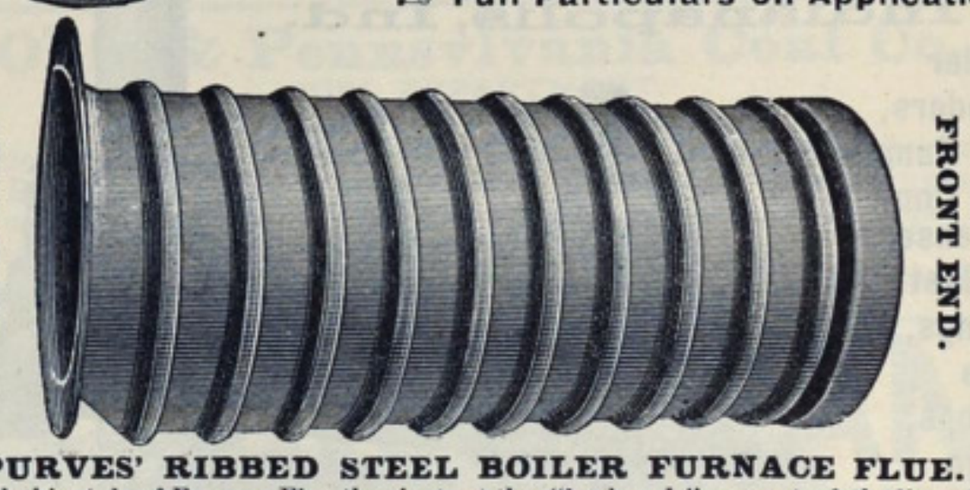

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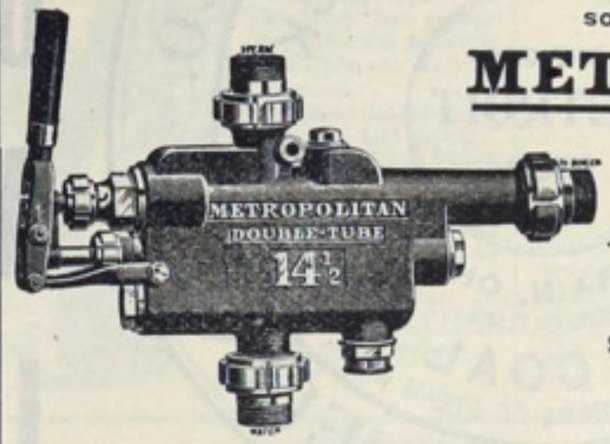

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